

the burst operation. The use of such an "effective amount" expression has long been recognized as acceptable in U.S. patent practice. *In re Halleck*, 164 USPQ 647, 57 CCPA 954 (CCPA 1970). In addition, Claims 5-8 were added to the application, which claims are supported in original Claims 1-4 and applicant's specification disclosure. Accordingly, Claims 1-8 are in the application for consideration by the Examiner.

Attached hereto is a marked-up version of the changes made to the specification and Claim 3 by the current amendment. The attached pages are captioned **"VERSION WITH MARKINGS TO SHOW CHANGES MADE."**

The Official Action set forth a single rejection of Claims 1-4 under 35 U.S.C. § 102(a) as being unpatentable over U.S. Patent No. 5,642,374 of Wakabayashi *et al.* (Wakabayashi).

Applicant respectfully submits that the teachings of Wakabayashi do not disclose or suggest the invention as set forth in the present claims within the meaning of 35 U.S.C. § 102(b) or 35 U.S.C. § 103(a).

The Official Action cited Wakabayashi at col. 12, lines 13-49, to support its position of unpatentability. However, applicant respectfully notes that while the teachings of Wakabayashi propose that cylinder 39 can be filled with krypton, xenon, argon, or other such rare gas at column 11, lines 6-14, of Wakabayashi, the teachings of Wakabayashi at col. 12, lines 13-49, do not discuss the presence of xenon in the laser chamber, but rather, proposes the use of fluorine, krypton and neon in a specific ratio of F₂:Kr:Ne. Since the

teaching of Wakabayashi do not teach everything in the claims, they cannot support a rejection under 35 USC 102(b). Furthermore, applicant respectfully submits the teachings of Wakabayashi do not recognize the importance and significance of the use of the small amount of xenon gas as opposed to other gases, namely, argon, krypton, or neon gas, which can be used equally as well as xenon (Xe) gas therein. For this reason, applicant respectfully submits that the teachings of Wakabayashi cannot motivate one of ordinary skill in the art to the presently claimed invention.

While Wakabayashi discusses Xe gas, the discussion in Wakabayashi about Xe gas is simply explaining an XeCl excimer laser. This Xe gas discussed in Wakabayashi is only the laser gas itself, but not an additive gas for a specific purpose as in the presently claimed invention. In other words, in the teachings of Wakabayashi Xe gas is only used as the gas that is essential for laser oscillation (i.e., main laser gas), which for example, corresponds to Ar gas of ArF excimer laser. In contrast thereto, in the presently claimed invention a small amount of Xe gas is added to the gas that is essential or used for laser oscillation (main laser gas). The applicants have discovered that adding a small amount of Xe gas to the excimer laser gas mixture significantly improves the laser oscillation characteristics. Namely, by the use of a small amount of additive xenon gas in accordance with the present claimed invention, the burst and spiking phenomena caused in an excimer laser output in the burst operation can be reduced. This is shown in Figs. 2-5 and the

accompanying discussion in applicant's specification disclosure. The teachings of Wakabayashi are completely silent with respect to these aspects of the present claimed invention and, thus, cannot possibly motivate one of ordinary skill in the art to the same .

Original Claim 3 was amended above to define a gas for excimer laser that contains an effective amount of an additive xenon gas for reducing burst and spiking phenomena caused in an excimer laser output in the burst operation. New Claim 5 defines, *inter alia*, means for supplying xenon gas as an additive into the gas for excimer laser in the chamber; and control means for controlling an amount of the xenon gas supplied to the chamber so that a concentration of the xenon gas in the chamber becomes a predetermined concentration by which burst and spiking phenomena caused in an excimer laser output in the burst operation can be lowered. Claims 1 and 4 contain similar definitions. These claims all define the use of small amounts of xenon gas for reducing burst and spiking phenomena caused in an excimer laser output in the burst operation. This claimed use of the xenon gas is different in both amount and function from the use of xenon gas in the main laser gas used for laser oscillation, such as Ar and of an ArF exciting or laser that is contemplated by Wakabayashi.

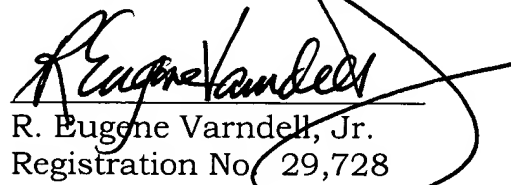
For the foregoing reasons, applicant respectively submits that the teachings of Wakabayashi cannot contemplate or suggest the invention as set forth in Claims 1-8 within the meaning of 35 U.S.C. § 102(b) or 35 U.S.C. §

103(a). Therefore, applicant respectfully requests that the Examiner reconsider and withdraw any and all rejections of the claims set forth in the Official Action mailed May 8, 2001, and allow all the claims present in the application.

In view of the foregoing amendment and remarks, favorable consideration and allowance of Claims 1-8 are respectfully requested. While it is believed that the present the application is in condition for allowance, should the Examiner have any comments or questions, it is respectfully requested that the undersigned be telephoned at the below-listed number to resolve any outstanding issues.

In the event any additional fees are due, please charge our Deposit Account No. 22-0256.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The seven paragraphs spanning page 3, line 15, through page 5, line 6, were amended as follows:

-- In order to achieve the aforesaid object, [the] a first aspect of the invention [according to claim 1] relates to an excimer laser device in which gas for excimer laser is sealed in a chamber and pulse oscillation is carried out in the chamber to excite the gas for excimer laser so to oscillate pulsed laser, wherein a predetermined amount of xenon gas in a predetermined concentration is supplied to the gas for excimer laser in the chamber to lower burst and spiking phenomena caused in an excimer laser output. --

-- Thus, the first aspect [according to claim 1] can readily improve the excimer laser output and stabilize the output without involving complex control because the predetermined amount of xenon gas in the predetermined concentration is supplied to the gas for excimer laser in the chamber to resolve the burst and spiking phenomena caused in the excimer laser output. --

-- The second aspect of the invention [according to claim 2] relates to an excimer laser device which comprises: a xenon gas cylinder in which the xenon gas to be supplied to the chamber is sealed; sensing means for detecting a concentration of the xenon gas added to the gas for excimer laser in the

chamber; and control means for controlling an amount of the xenon gas supplied from the xenon gas cylinder to the chamber based on the concentration of the xenon gas detected by the sensing means. --

-- Thus, the second aspect [according to claim 2] can readily improve the excimer laser output and stabilize the output by mounting the xenon gas cylinder, the detecting means and the control means to a conventional excimer laser device because the concentration of the xenon gas added to the gas for excimer laser in the chamber is detected, and the supply amount of the xenon gas sealed in the xenon gas cylinder to the chamber is controlled according to the detected concentration of the xenon gas. --

-- The third aspect of the invention [according to claim 3] relates to gas for excimer laser used for an excimer laser device which oscillates pulsed laser by exciting gas for excimer laser sealed in a chamber, wherein the gas for excimer laser contains at least a predetermined concentration of xenon gas. --

-- Thus, the third aspect [according to claim 3] is configured to contain at least the predetermined concentration of xenon gas in addition to halogen gas in the gas for excimer laser, so that the excimer laser output can be readily improved and the output can be stabilized by merely supplying the gas for excimer laser into the chamber. --

-- The fourth aspect of the invention [according to claim 4] relates to gas for excimer laser which contains 200 ppm or below of the xenon gas. --

IN THE CLAIMS:

Claim 3 by was amended as follows:

-- 3. (Amended) Gas for excimer used for an excimer laser device which oscillates pulsed laser by exciting gas for excimer laser sealed in a chamber, wherein the gas for excimer laser contains an effective amount [at least a predetermined concentration] of an additive xenon gas for reducing burst and spiking phenomena caused in an excimer laser output in the burst operation. --